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(72) Inventors:
• Cai, Yi
Eatontown, NJ 07724 (US)
• Cai, Jin-Xing
Morganville, NJ 07751 (US)
• Nissov, Morten
Ocean, NJ 07712 (US)

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(71) Applicant: **Tyco Electronics Subsea Communications LLC**
Morristown NJ 07960 (US)

(74) Representative: **Brookes Batchellor LLP**
102-108 Clerkenwell Road
London
EC1M 5SA (GB)

(54) **System and method for forward error correction decoding using soft information**

(57) A system and method for soft decision forward error correction (FEC) decoding is used to determine a possible error in a differential detection signal, for example, in a DPSK system. The system and method uses

the constructive and destructive signals from a demodulator to provide an error locating signal. Using the error locating signal, the system and method converts the differential detection signal into a soft decision signal including multi-level soft values.

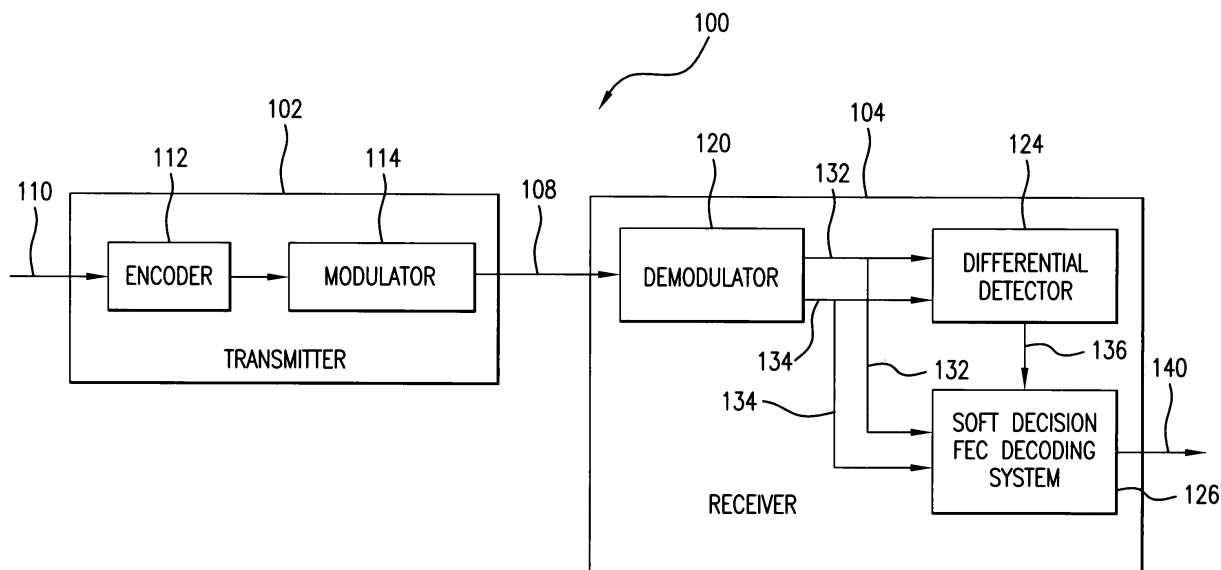


FIG.1



EUROPEAN SEARCH REPORT

Application Number
EP 05 25 7898

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	AKITA M ET AL: "Forward Error Correction Based on Block Turbo Code With 3-Bit Soft Decision for 10-Gb/s Optical Communication Systems", IEEE JOURNAL OF SELECTED TOPICS IN QUANTUM ELECTRONICS, IEEE SERVICE CENTER, PISCATAWAY, NJ, US, vol. 10, no. 2, 1 March 2004 (2004-03-01), pages 376-386, XP011113532, ISSN: 1077-260X, DOI: 10.1109/JSTQE.2004.827846 * page 382, right-hand column, paragraph 4 - page 383, left-hand column, paragraph 1 *	1-10	INV. H04L1/00 H04L25/06 H04B10/158 H04L27/233
A	EP 1 427 158 A1 (MITSUBISHI ELECTRIC CORP [JP]) 9 June 2004 (2004-06-09) * the whole document *	1-10	
A	EP 1 383 254 A1 (MITSUBISHI ELECTRIC CORP [JP]) 21 January 2004 (2004-01-21) * paragraphs [0021], [0033] * * paragraph [0036] - paragraph [0037] * * paragraph [0040] * * figure 2 *	1-10	TECHNICAL FIELDS SEARCHED (IPC) H04B H04L
A	EP 0 174 612 A2 (GRIDCOMM INC [US]) 19 March 1986 (1986-03-19) * page 3, line 28 - line 30 * * page 4, line 24 - page 5, line 3 * * page 5, line 19 - line 21 * * page 12, line 3 - line 27 * ----- -/--	1-10	
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 13 April 2012	Examiner Stolte, Norbert
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

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EPO FORM 1503 03.82 (P04C01)



EUROPEAN SEARCH REPORT

Application Number
EP 05 25 7898

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A,P	BILENCA A ET AL: "Soft Detection of Multichip DPSK Over the Nonlinear Fiber-Optic Channel", IEEE PHOTONICS TECHNOLOGY LETTERS, IEEE SERVICE CENTER, PISCATAWAY, NJ, US, vol. 17, no. 9, 1 September 2005 (2005-09-01), pages 2001-2003, XP011138101, ISSN: 1041-1135, DOI: 10.1109/LPT.2005.852325 * section II * -----	1-10	
			TECHNICAL FIELDS SEARCHED (IPC)
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 13 April 2012	Examiner Stolte, Norbert
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

1
EPO FORM 1503 03 82 (P04C01)

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ON EUROPEAN PATENT APPLICATION NO.**

EP 05 25 7898

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The members are as contained in the European Patent Office EDP file on
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13-04-2012

Patent document cited in search report			Publication date		Patent family member(s)		Publication date	
EP 1427158	A1	09-06-2004	EP	1427158	A1	09-06-2004		
			JP	3863058	B2	27-12-2006		
			JP	2003163637	A	06-06-2003		
			US	2004131368	A1	08-07-2004		
			WO	03026239	A1	27-03-2003		

EP 1383254	A1	21-01-2004	EP	1383254	A1	21-01-2004		
			JP	2002330104	A	15-11-2002		
			US	2004062556	A1	01-04-2004		
			WO	02089365	A1	07-11-2002		

EP 0174612	A2	19-03-1986	EP	0174612	A2	19-03-1986		
			JP	61084143	A	28-04-1986		
			US	4577333	A	18-03-1986		

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82